Teacher and Student Cognitions During Team Building Activities

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Abstract

This study investigated the cognitions of a teacher and four adolescent students during their involvement in critical thinking (CT) activities. Content analysis yielded a multi-dimensional construct of teacher, student, and teacher/student thought patterns. The teacher created a supportive learning environment, provided activities that maximized involvement and opportunities for success, and facilitated the CT process. The students initially approached the CT tasks from a nonstrategic perspective but gradually adopted more thoughtful approaches to the tasks. In doing so, the students provided evidence of both CT skills and CT dispositions; attributes not usually associated with the at-risk adolescent learner.

The purpose of this study is to describe the critical thinking cognitions and dispositions of a teacher and a group of young adolescent at-risk students during critical thinking activities. We attempt to capture salient elements of their thought patterns gleaned from an analysis of stimulated-recall interviews. This qualitative investigation provides an account of the students' relationships with each other, the teacher's thoughts in planning and implementing critical thinking activities, and the interactions between teacher and students. In exploring the teacher and students' cognitions, a multi-perspective construction of the learning environment emerged.

Adolescence provides opportunities for individuals to make decisions and select certain paths that impact the rest of their lives. For many, these decisions ultimately lead to productive and satisfying lives. For others, however, poor decision-making combined with school and societal pressures lead to a cycle of "alienation, substance abuse, absenteeism, and dropping out of school.…" (*Turning Points*, 1980, p. 9). While a case can be made for all adolescents being "at risk," those students who risk school failure and dropping out prior to high school graduation are of particular concern and interest.

Perhaps the most powerful and frequently studied correlates of at-risk youth involve social class, race and family structure. Overall, at-risk students tend to be disproportionately drawn from families of low socioeconomic status and are often members of minority groups (Bianchi, 1984; Coleman, 1989; Stevenson & Baker, 1987). Additional predictors of dropping out include being members of single-parent families (Bianchi, 1984; Dornbusch, Ritter, Roberts & Fraleigh,1987), earning low grades, and being male (Alpert & Dunham, 1986; Ekstrom, Goertz, Pollack, & Rock, 1986; Velez, 1989).

A second area receiving much attention in the educational literature is critical thinking (CT). In the 21st century developing competent thinkers able to compete in a global society becomes increasingly important. Critical thinking, though, will not occur without conscious and deliberate efforts on the part of classroom teachers. Unfortunately, as Peterson, Kromrey, Borg and Lewis (1990) note, little evidence of such efforts occurs in most classrooms. It is for this reason that Underbakke, Borg and Peterson (1993) advocate the teaching of CT and preparing teachers who will make critical thinking skills a priority in their classrooms.

For the most part, these two important areas of

study remain mutually exclusive. While many educators decry the lack of critical thinking in traditional classrooms, Levine (1988) notes the lack of emphasis on developing critical thinking skills with at-risk students. He points out that mechanical skills, rote memory, and regurgitation of facts are primarily stressed, not higher order thinking skills. Levine and Eubanks (1990) speculate that teachers focus on the lower skills test scores of minority students compared to their white counterparts. They then may devote too much time and energy closing this "relatively small gap" and ignore the larger more important disparities in comprehension and thinking skills.

The present study attempts to bring these two "worlds" together. We examined a group of early adolescents described as at-risk as they participated in tasks where critical thinking was an integral component. In a setting outside the traditional classroom environment, we use descriptions of teacher and learner perspectives to chart and construct the thought processes and perspectives of the participants as they solved a variety of ill-defined (i.e., no one 'right' solution) problems.

Method

Participants

Voluntary participants included one teacher and four students attending an all-boys outdoor summer camp. Brent, the instructor, along with Jack, Alan, Matthew and Jason are pseudonyms for the participants. The boys, part of a camp population of children, aged 10 and 11 years, exhibited many of the previously described correlates of at-risk students. The participants were male, two-thirds were African-American or Hispanic, many came from single-parent families and all were financially disadvantaged. Two four-week sessions are held each summer with a new group of students arriving to the camp for the second session. In each camp session, two groups (9–12 students) participated in an initiative games class. Within each of the four groups, one student was selected at random for study.

Procedure

As part of their regular camp activities, the students participated in an initiative games class three times per week. Initiative activities require group cooperation and critical thinking in order to solve a challenge or problem. We videotaped one lesson each during weeks two, three and four of each camp session. All lessons lasted 40 minutes.

Following each lesson, the four students (one from each of the groups observed) watched the videotape and engaged in a stimulated-recall interview. At three-minute intervals we stopped the videotape and asked: (1) What is going on in this section, (2) What were you thinking about, and (3) What did you notice about the other students? Responses to the above questions produced not only individual cognitions, but also yielded rich descriptions of what was going on within and between the group members as they searched for solutions to the various challenge activities.

At the completion of the study, the principal investigator randomly selected one of the videotaped lessons for a stimulated-recall interview with the instructor. The interview protocol followed that of the students.

All interviews were tape-recorded and transcribed. Once transcribed, two members of the research team coded the interviews and began content analysis procedures. Content analysis of the teacher and student responses produced categories derived inductively and are presented in the results section. Disagreements regarding coding categories were discussed until agreement was reached so that all final coding was consensual.

Results

Content analysis (Lincoln & Guba, 1985) of the interviews yielded a three-dimensional categorization of thoughts. The first characterization captures the teacher's thoughts in preparing, monitoring, and assessing student progress during the activities. Second, the students' characterizations are presented. Finally, a third category of cognitions reflecting the interactive nature of both teacher and students' thoughts during the activities is presented. Each of these three categories or dimensions reflects the unique perspectives of the participants during the critical thinking activities.

Teacher Cognitions

Preparing a safe learning environment for the students, emotionally as well as physically emerged as the first teacher category. Each lesson began in an informal manner where students were asked to talk about themselves and their interests—favorite sport, athletic shoes, and so on. These "check-in" activities served to establish an atmosphere whereby students could participate and contribute to the group without fear of failure or reprimand. In essence, the teacher created a "no fault zone" for the students. In describing the process, the instructor said:

> We were doing our check-in time, where we go around and we see how everyone is doing. And I try to come up with a creative question, like opening with a question each day, like, 'what's your favorite sport? What's your favorite food?' Or something just to get them talking with each other, getting them sharing about different things about themselves.

The check-in time also provided an opportunity to guide the students toward making connections from prior activities to apply to the upcoming task. The teacher encouraged the learners to brainstorm in order to generate several ideas from which they could then choose to try to solve the task:

> Instead of just using one single idea and sticking with it if it's not working, try to brainstorm and come up with a menu of ideas, and to choose the best ones or bits and pieces from each one.

Upon completion of the check-in time, the instructor introduced the new critical thinking task. In preparing the learning environment, the teacher described the objectives and listed the parameters of the task, after which students asked questions for clarification. As part of this structuring component, students received instruction on safety concerns that needed to be adhered to during the activity. The teacher stressed, "You want to be aware of the safety concerns for the group." Upon completion of this lesson segment, the learners began the task.

At this point in the lesson the teacher adopted a non-directive role while overseeing the activity. Instead of controlling the activity, he became a facilitator. While monitoring student progress, he deliberately remained in the background and allowed the students to formulate and implement their own strategies. Only when the students reached an impasse or when safety was a concern did the teacher intervene:

> … I wanted to let them decide for themselves … and it [the students' strategy] wasn't probably the best way to do it, without jumping in and telling them what to do.

Intervention primarily took the form of indirect questioning or prompting. When safety became a concern during an activity, the instructor commented:

> Instead of telling them 'don't climb up on shoulders' or 'don't stack,' I tried to kind of cue them by saying things like, 'what's going to happen if he falls while he's on his shoulders?' or 'what's it going to be like for the people on the bottom?'

Another category emerging from the content analysis was that of teacher as assessor. While monitoring the students' attempts to solve the task, the instructor constantly assessed the group dynamics, levels of involvement, and their choice of strategies. Of particular note was his concern about the students' level of involvement after the initial novelty and excitement began to wane:

> Because they weren't super discouraged but they seemed to be, you know, they had been working at it a long time and seemed to be kind of losing some of their pizzazz for the activity.

At one point the teacher decided to let a group of students take a break and move on to another activity because of repeated unsuccessful attempts.

The teacher also noted that when the students experienced several unsuccessful attempts at solving the problem, they began to work together to generate alternative strategies. He commented that, "They were coming up with several kinds of ideas" and later noted how "they switched from one idea to

another a couple of times." Concurrent with generating more refined strategies, the instructor also noticed evidence of group cooperation beginning to emerge:

> There's a lot of talking going on, communication, a lot of … there's a lot of touching, a lot of balance, a lot of teamwork and those kinds of things.

Instead of everyone trying to do "their own thing," the students began to talk among themselves, listen to alternate points of view, and work together.

The instructor also wanted the students to see the relevance of what was learned in previous activities and how it might be applied to the present task. He tried to get the students to transfer prior strategies and ideas for implementation in the new activity, "I was trying to get them to think … back to the time that it [the strategy] worked the best and try to duplicate it." Such teacher prompting for transfer served to redirect student efforts to formulate new strategies. Of particular import were attempts to get the learners to synthesize earlier strategies and ideas for application to the new task, "I was trying to get them to think about how they could take pieces from different ideas and put them together."

Leading a post-activity debriefing session emerged as the final teacher role. The instructor referred to this component of the lesson as "process time" and used it to elicit descriptions of things the students had experienced and learned during the task. He asked them to reflect about the preceding activity:

> After the activities are done we have a process time where we talked about what happened and what kinds of things went on, and what you can learn from this.

Specifically, he asked the students about what things worked well, what kinds of things did not work so well, and what kinds of things "have you been doing in this activity?" The process time afforded yet another opportunity for the teacher to help the students make connections from previous sessions. To bring the lesson full cycle, the instructor again prompted the students to recapture the relevance of previous activities and strategies and their application to the activity just completed. He felt that:

> They [students] seemed pretty in tune with what I was looking for answer-wise, because we've talked about a lot of stuff over and over in these other sessions. Each session we talk about something kind of along these lines.

Perhaps most important of all, the instructor wanted the students to be aware of the thought processes and the cooperation necessary for successful completion of the task. He wanted to take them beyond the surface gamelike aspect of the activity:

> So when you can take a step back and talk about what else was going on besides the fun factor and the work factor, they seemed to respond to that.

The instructor encouraged the students to move beyond the act and the effort to reflect on and assess their effectiveness in solving the task.

Student Cognitions

Analysis revealed a developmental sequence in the students' approach to the critical thinking tasks. Provided only with the objectives of the task, the rules and parameters for participation, the students' initial attempts were characterized by a lack of an organized or strategic plan for solving the task. The typical response to the instructor's challenge was to immediately start solving the task without any preset discussion of strategies. Jason remarked: "We were playing 'All Aboard' and at first we were just trying to get on all at once. And we tried that twice and that didn't work."

The dissonance created by an inability to generate a successful solution led the learners to step back and reassess and reevaluate the task. When success was not forthcoming, the students took a more thoughtful approach to solving the task. They realized that the tasks were not as simple as they initially appeared. Jack commented, "It was hard. We didn't have nothing to write on, or anything like that." Jason's comment embraced the recognition

that: "… this was going to be hard 'cause you can't say 'you get over there and you get over there' … we were going to have to use our mind."

It was at this point that the students started to make connections between the instructor's earlier prompts to brainstorm for ideas and finding a solution to the activity. Jack remarked, "Well, Brent (the teacher) told us to, like, go back to our ideas that we made up, so we went back to our ideas and make up some more ideas." The students reassessed the task and began a more thoughtful approach. Matthew commented "… some people were walking around, looking at the board, and trying to think of other ideas." Evidence of rudimentary leadership also emerged. Students now realized that they needed to listen to each other and work together in order to solve the task. Alan observed that, "Two of them, a couple of them were trying to be leader and were telling where to get where. Who goes where."

As the leadership roles emerged, so did the cooperative element. Students began to work together in order to achieve success. Jack noticed, "Some people were going after others by themselves and others were working together." The participants reflected that as the activities progressed, "working together" became a more frequent response to the question, "What did you notice about the other students?" During one activity, for example, Matthew noticed that "… when they were trying to do this activity they were working together and using everybody's help and trying to get everyone on."

Students began to entertain alternate points of view and to help each other. Prior strategies were modified and new ones developed and evaluated. Matthew noted, "We were trying to think of another way to get better at getting in line by ages" and a short time later commented, "They were getting in line and they were yelling out their age and helping each other." The group appeared to become a more cohesive unit, working together to solve the task. They also became somewhat more cautious of the strategies being developed. Jason concluded, "I didn't think this was going to work because it didn't work last time."

As the critical thinking activities became more complex, the students' level of thinking became more sophisticated. During one activity, Matthew thought that flipping a small platform over would be a successful strategy. When asked why he thought so, he rationalized, "Because it had two sides that were higher than the middle … the small people could get into the middle and kind of lean over just in case the big kids lost their balance."

Teacher/Student Interactions

As a consequence of analyzing the teacher and student roles separately, a third construct emerged. We noted a number of related or overlapping cognitions expressed by the participants as they responded to the interview questions. Structuring the lesson to include a check-in and debriefing time, for example, were pre-planned interactive components of the lesson. The teacher noted:

> … they seemed to like the check-in time because I let them come up with different questions and they come up with all kinds of stuff about shoes and wrestlers and all kinds of stuff. So they enjoy that.

The debriefing session formed a second structured component within the lesson. The teacher's purpose was to:

> Have a little process time to talk about some of the things I said before like what things were working well, what kinds of things aren't working so well, what kinds of things have you been doing in this activity.… So I was trying to get them to think about the different kinds of things they've actually been doing while they were doing this activity.

Alan corroborated this part of the lesson when, at the end of one of the activities he said, "We were fixin' to go to our next activity. We got into our circle and talked about what we did." And later he commented, "They [the other students] were just in the circle listening to what other people had to say."

Many informal interactions also occurred during the critical thinking activities. These interactions were not deliberately planned by the teacher but occurred as a result of students' responses to the activity. The teacher used the cues in the environ-

ment to formulate the decision of whether or not to intervene. These interventions came primarily through the use of prompts and hints in the form of questions.

At the heart of each task was the teacher's desire to engage the students in critical thinking without constant mediation:

> Because, I think it's good to let them work with it even if it seems hard for them to … even if they get a little discouraged, because it's a lot better for them to figure it out on their own than for me to jump in and tell them what to do, even if it saves them a little time. So I was thinking about what was the right amount of time to let them work with it before I gave them any kind of a hint.

Matthew provided evidence of the teacher's indirect role during the Stepping Stones activity when he remarked, "Coach Brent was telling us if we had any more solutions, different solutions, and tried to make us think."

Discussion

Through content analysis of teacher and student interviews, we identified salient elements of the participant's thought patterns. Additionally, we noted a multi-dimensional construct of teacher, student and teacher/student interactions that reflected the unique perspectives each brought to the learning environment. Of particular interest was the manner in which the teacher prepared the learning environment. Each critical thinking activity ensured that students were active contributors to the learning process.

An essential element in each of the initiative games was the opportunity for success provided by the teacher. Since the at-risk student is often viewed as a "low-achieving learner plagued by academic failure" (Presseisen, Richman & Beyer, 1992, p. 10), the importance of providing for success cannot be understated. Schoel, Prouty, and Radcliffe (1988) agree. They noted that when groups learn they can experience and overcome difficult challenges with peer support and feel rewarded for doing so, a powerful success experience is generated. The ill-defined nature of each task combined with working in small groups appeared to maximize opportunities for student success. The participants worked together in a student-centered environment that permitted group collaboration, peer support, and ongoing discussion.

The instructor identified the purpose of each task, provided parameters for task pursuit, and listed safety concerns at the beginning of each lesson. Once the teacher explained and clarified each task, he turned over responsibility for finding a solution to the students. Further instruction was non-directive and the emphasis shifted to student participation.

By shifting the responsibility for learning to the students, the instructor also increased the opportunities for social dialogue among the participants. Affording the opportunity for discussion among learners represents a break from traditional teacher-dominated classroom discourse and can, theoretically, improve the quality of assisted performance by teachers and peers (Englert, et al., 1991; Rosenshine & Meister, 1992). As a result of the teacher's actions, the students were able to initiate their own discussions. They listened to each other's ideas and strategies and, as a group, decided which ideas to accept, implement, or reject. The students became active participants in the learning process and not simply "objects waiting to be filled with facts and figures" (Bartelome, 1994, p. 183).

The students had to work together and generate appropriate strategies to be successful. The instructor monitored the activity closely and provided feedback when he thought students needed guidance or if safety was an issue. The evaluation offered, however, was not for the purpose of rejecting the learner's efforts. Rather it served the purpose of allowing students to make appropriate strategy adjustments and provide information to help guide them toward productive solutions.

From the students' perspective, evidence of critical thinking skills and critical thinking dispositions emerged. A two-phase approach seemed to characterize the student roles when solving the task. The initial challenge and novelty of the tasks lent a gamelike nature to the activity that immediately caught their attention and interest. While interest

levels were high, the learners did not stop to consider the difficulties inherent to the task. The main focus appeared to be accepting and responding to the challenge. Strategy formation perhaps could be best characterized as "chaotic polyphony," that is, many voices speaking at once. Only after repeated failures and an accompanying waning of initial enthusiasm did the learners begin to see the need for generating and evaluating cogitative strategies.

At this point of the task, the students entered a second, more thoughtful phase and indications of strategy formation emerged. Pressley et al. (1990) state that a strategy is "composed of cognitive operations over and above the processes directly entailed in carrying out the task" (p. 3). The first phase of addressing the critical thinking tasks could be seen as nonstrategic. That is, the students exhibited nothing over and beyond the immediate goal of the task. An example of this was Jason's observation early on in one activity noting that his group was just trying to get onto a small platform all at once.

During the second phase, though, leaders began to emerge and, with teacher guidance, the groups began to develop more thoughtful strategies. This developmental pattern of thinking is reflective of Vygotsky's (1978) belief that skilled thinking develops through social-instructional interactions with more proficient thinkers. While some students appeared to be more thoughtful than others, the teacher provided much of the guidance during the activities. As mentioned earlier, though, the guidance was more in the form of cues and prompts and was not in the form of systematic and/or in-depth critical thinking instruction.

The students provided consistent evidence of persistence, cooperation, listening to alternative ideas and demonstrating leadership qualities—all of which illustrate the dispositional side of critical thinking. These dispositions are important because they provide a vital affective dimension that supports as well as drives the critical thinking process (Beyer, 1987; Ennis, 1987). In order to be effective critical thinkers, participants must first be predisposed to the process. Perkins, Jay, and Tishman (1993) posit the belief that thinking dispositions are comprised of inclination, sensitivity and ability. All three elements must be present in order for dispositional behavior to occur. That is, the learner must have the inclination or the felt tendency toward thinking, she must be sensitive to the opportunities to so, and finally, he must have the ability or basic capacity to carry through. A shortfall in any of these three areas can result in the failure to activate the thinking-dispositional behavior (Tishman, 1994).

To varying degrees the students provided evidence, though not always polished or refined, of the above elements. The inclination to engage in thinking may have been triggered by the nature of the task itself. The element of challenge and the thought processes inherent to solving the tasks seemed to appeal to the students' sense of adventure. They willingly engaged in the process of trying to generate solutions for the various critical thinking tasks. The students also appeared to have the capabilities and skills necessary to solve the tasks. What was often lacking, though, was a more sophisticated and systematic application of key critical thinking skills to the task at hand.

Even though the teacher provided structured opportunities for students to reflect on strategies that worked well (or not), to transfer what had been learned in previous activities, and to listen to group members ideas, the students were not always sensitive to these instructional components. They did not always make the connections and apply these strategies in a conscious manner to a new task even with the assistance of the teacher's cues and prompts.

In preparing the learning environment, the instructor appeared to provide what is often referred to in the literature as "scaffolded instruction." While the precursory evidence presented might support this notion, the teacher provided no conscious indication or understanding of this concept. While a supportive learning environment was noted, evidence of scaffolding in the formal pedagogical form described by Meyer (1993), Wood, Bruner and Ross (1976) and others cannot be claimed.

What the teacher did provide, though, was a supportive learning environment in which he developed a positive affective relationship with the students. Parish and Parish (1988) state that positive associations with other peers and teachers is crucial in order to reduce the sense of social isolation often encountered by at-risk students. By providing activi-

ties that maximized involvement and opportunity for success, the students could take pride in their accomplishments and those of their group members. According to Parish and Parish (1988), these positive associations with others allow students to relate their own sense of identity with that of other successful peers and teachers. By doing this, the instructor established a sense of "belongingness" within the group; a characteristic that Hahn (1987) suggests may increase the likelihood of at-risk students finishing school.

Furthermore, the teacher's non-directive, accepting pedagogical style suggests an alternative to the deficit orientation frequently assumed about "at-risk" students. Deficit orientation implies a deficiency within the learner or his/her context (Bartelome, 1994). Such an assumption may lead some teachers to employ a controlling, authoritarian pedagogy with their students (Haberman, 1991). The results of this study, though, suggest that the teacher's positive, non-directive style with this group of at-risk participants in this setting created an environment conducive to fostering rudimentary elements of critical thinking. Faced with a series of challenges the students, assisted by the teacher, responded in a manner not usually associated with at-risk learners.

Because this study occurred in a non-traditional milieu, no attempts to generalize are made. The positive results may well be due to a setting that did not have the kinds of constraints typical of many traditional classrooms. That is, the teacher only worked with small groups and dialogue was not constrained by "atypical formats such as cycles of known-answer questions followed by short student responses and ending with teacher evaluations" (Meyer, 1993, p. 45).

Nevertheless, the positive effects noted in this non-traditional setting may have some direct implications for the traditional classroom setting many adolescent students face on a daily basis. First, the activities were both motivating and enjoyable to this group of participants. If we expect students (at-risk or not) to become critical thinkers, then the activities teachers provide must be relevant and interesting. The physical challenges of the tasks certainly appealed to the boys, but the critical thinking inherent to the tasks kept them actively engaged over time.

Second, when critical thinking activities were presented in a non-threatening and supportive environment, this group of young adolescents demonstrated not only an interest to engage in them, but showed surprising diligence and determination in seeing the challenges through to some kind of solution. They felt comfortable to take risks and the teacher encouraged rather than discouraged them when initial attempts were unsuccessful.

Third, this group of participants did demonstrate evidence of rudimentary critical thinking skills and dispositions. They took note of the teacher's questions, synthesized previous information, generated and then tested hypotheses in their search for solutions. Additionally, the participants listened to alternative ideas, worked together, and noted leaders emerging in their midst. Providing challenging tasks and working in cooperative groups to generate solutions seemed to serve as powerful stimulants to the critical thinking process for this group of participants.

Finally, the non-directive role taken by the teacher may have important implications for classrooms. The teacher became a facilitator rather than a controller of information. He "stepped off center stage" and allowed the students to pursue solutions to the tasks. Rather than telling the students the answer, the instructor guided them, often through questioning. By doing so, the teacher shifted the responsibility for learning to the students.

Future research needs to expand the number of participants and investigate a variety of classroom settings. Also, because this study relied heavily on the use of structured interviews, future studies might also incorporate more observational data techniques to assess the students' role in fostering critical thinking.

The manner in which these students embraced the challenges and displayed incipient evidence of critical thinking and critical thinking dispositions is encouraging. While these skills were not at a sophisticated level, the learners nevertheless provided positive indicators of critical thinking. These are attributes not usually associated with at-risk learners and are attributes worthy of continued study for all students.

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